4 4

ANALYTICAL REPORT

PREPARED FOR

Attn: Terri Choy AECOM 1001 Bishop Street Honolulu, Hawaii 96813

Generated 6/20/2023 11:48:58 AM

JOB DESCRIPTION

Red Hill - AFFF Assessment Sampling

JOB NUMBER

580-128311-1

Eurofins Seattle 5755 8th Street East Tacoma WA 98424

Eurofins Seattle

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northwest, LLC Project Manager.

Authorization

M. Elaine Walker

Generated 6/20/2023 11:48:58 AM

Authorized for release by Marie Walker, Senior Project Manager M.Elaine.Walker@et.eurofinsus.com (253)248-4972 __'

3

4

5

6

8

9

10

Client: AECOM

Laboratory Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Table of Contents

Cover Page	1
Table of Contents	3
Case Narrative	4
Definitions	5
Client Sample Results	
QC Sample Results	8
Chronicle	9
Certification Summary	10
Sample Summary	11
Chain of Custody	12
Receipt Charklists	14

_

6

8

9

Case Narrative

Client: AECOM Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-128311-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM
Project: Red Hill - AFFF Assessment Sampling
Report Number: 580-128311-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Two samples were received on 6/13/2023 4:12 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.1° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GLYCOLS

Samples AF-RHMW02-WGN01LF-2306 (580-128311-1) and AF-RHMW03-WGN01LF-2306 (580-128311-2) were analyzed for glycols in accordance with EPA SW-846 Method 8015B - DAI. The samples were analyzed on 06/15/2023.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

9

3

4

5

6

9

10

Definitions/Glossary

Client: AECOM Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Qualifiers

GC Semi VOA

 Qualifier
 Qualifier Description

 M
 Manual integrated compound.

 U
 Undetected at the Limit of Detection.

Glossary

DLC

Olocoul, y	
Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

Decision Level Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent
POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

Eurofins Seattle

6/20/2023

Page 5 of 14

2

3

4

5

6

9

Client Sample Results

Client: AECOM Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW02-WGN01LF-2306 Lab Sample ID: 580-128311-1

Date Collected: 06/09/23 10:20 Matrix: Water

Date Received: 06/13/23 16:12

Analysis	Decut Qualifier	100	DI IInit	_	Dramarad	
Method: SW846 8015C GLY	- Glycols- Direct Injection	(GC/FID)				

Analyte	Result Qualifier	LOQ	DL Unit	D Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	30 UM	5.0	1 1 mg/l		06/15/23 19:40	

2

A

4

6

R

9

10

Client Sample Results

Client: AECOM Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW03-WGN01LF-2306 Lab Sample ID: 580-128311-2

Date Collected: 06/09/23 12:05 Matrix: Water

Date Received: 06/13/23 16:12

Analyte	Result	Qualifier	LOQ	DL (Unit	D	Prepared	Analyzed	Dil Fac	
2-(2-Butoxyethoxy)ethanol	3.0	U	5.0	1 n	ma/l			06/15/23 20:03	1	

4

6

R

9

10

QC Sample Results

Client: AECOM Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Method: 8015C GLY - Glycols- Direct Injection (GC/FID)

Lab Sample ID: MB 680-783818/10 **Client Sample ID: Method Blank** Prep Type: Total/NA

Matrix: Water

Analysis Batch: 783818

MB MB

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U	5.0	1.1	mg/L			06/15/23 16:13	1

Lab Sample ID: LCS 680-783818/1006 **Client Sample ID: Lab Control Sample Prep Type: Total/NA**

Matrix: Water

Analysis Batch: 783818

	Spike	LCS	LCS		%Rec
Analyte	Added	Result	Qualifier Un	it D %Re	ec Limits
2-(2-Butoxyethoxy)ethanol	20.0	20.8	ma	/1 10	04 50 - 150

Lab Sample ID: LCSD 680-783818/7 Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

Matrix: Water

Analysis Batch: 783818

Spike LCSD LCSD %Rec RPD Analyte Added Result Qualifier Unit Limits RPD Limit D %Rec 2-(2-Butoxyethoxy)ethanol 20.0 17.4 50 - 150 mg/L

Lab Sample ID: 580-128311-2 MS Client Sample ID: AF-RHMW03-WGN01LF-2306 **Prep Type: Total/NA**

Matrix: Water

Analysis Batch: 783818

_	Sample	Sample	Spike	MS	MS				%Rec	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
2-(2-Butoxyethoxy)ethanol	3.0	U	20.0	20.3		mg/L		101	50 - 150	

Lab Sample ID: 580-128311-2 MSD Client Sample ID: AF-RHMW03-WGN01LF-2306

Matrix: Water

Analysis Batch: 783818

-	Sample	Sample	Spike	MSD	MSD				%Rec		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
2-(2-Butoxyethoxy)ethanol	3.0	U	20.0	18.9		mg/L		95	50 - 150	7	50

Prep Type: Total/NA

Lab Chronicle

Client: AECOM Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW02-WGN01LF-2306

Lab Sample ID: 580-128311-1 Date Collected: 06/09/23 10:20

Matrix: Water

Date Received: 06/13/23 16:12

Batch Batch Dilution Batch Prepared Method **Factor** Number Analyst or Analyzed **Prep Type** Type Run Lab 06/15/23 19:40 Total/NA Analysis 8015C GLY 783818 DBM **EET SAV**

Client Sample ID: AF-RHMW03-WGN01LF-2306

Lab Sample ID: 580-128311-2

Matrix: Water

Date Collected: 06/09/23 12:05 Date Received: 06/13/23 16:12

Batch Batch **Dilution** Batch Prepared Number Analyst **Prep Type** Type Method Run Factor Lab or Analyzed 06/15/23 20:03 Total/NA Analysis 8015C GLY 783818 DBM EET SAV

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Eurofins Seattle

6/20/2023

Accreditation/Certification Summary

Client: AECOM Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Laboratory: Eurofins Savannah

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority		Program	Identification Number	Expiration Date
ANAB		Dept. of Defense ELAP	L2463	09-22-24
The following analyte the agency does not		port, but the laboratory is not	certified by the governing authority.	This list may include analytes for which
Analysis Method	Prep Method	Matrix	Analyte	
8015C GLY		Water	2-(2-Butoxyethoxy)ethanol	

Sample Summary

Client: AECOM Job ID: 580-128311-1

Project/Site: Red Hill - AFFF Assessment Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-128311-1	AF-RHMW02-WGN01LF-2306	Water	06/09/23 10:20	06/13/23 16:12
580-128311-2	AF-RHMW03-WGN01LF-2306	Water	06/09/23 12:05	06/13/23 16:12

- 0

_

0

9

5755 8th Street East Tacoma, WA 98424

Chain of Custody Record

	Sampler Mad	Y M		Lab F								Carrie	Trac	king N	o(s):	A fu	A	16 2	COC No:		
Cilent Information					ie Wa	ilker									7	D19.	<u> 7994</u>		2306AFEA01		
Client Contact.	Phone: 308-	349-4.	738	E-Ma M FI		Valkei	r@Ft	ırofins	sET co	om		State of Hawa		in:					Page: Page 1 of 1		
Company [.]	1 /	·	PWSID:	X	<u> </u>	10													lob #:		
AECOM									Ana	ilysis	Rec	juest	ed					\perp			
Address	Due Date Requeste																	- 1	Preservation Co		
1001 Bishop St Suite 1600 City	see subcontract				11	4		AND SECTION OF	Company of the last	Name and Address of the Owner, Name of the Owner, N	-	AND SECTION AND ADDRESS OF THE PARTY OF THE	-		-	Distriction of the	\supset		A HCL B NaOH	M Hexane N None	
Honolulu	IN Nednested (n)	Rush - 5	Dav		H	or Company										1	/		B NaOH C Zn Acetate	N None O AsNaO2	
State, Zip			-] [ē										/			D Nitric Acid	P Na2O4S	
Hawali 96813	Compliance Project	t. Δ Yes	Δ No			Ę								J	4				E NaHSO4 F MeOH	Q Na2SO3 R Na2S2O3	3
Phone: 808-954-4512 / 770-331-0794	PO#:				a	8015C_DAL_GL_D5/2-(2-butoxyethoxy)-ethano					ļ.		J	4				- 10	G Amchlor H Ascorbic Acid	S - H2SO4 T TSP Dod	
Email	WO #:				2 5 6	ŧ						IJ						- [1	l ice	U Acetone	coarryurate
Watson Tanji (watson tanji@aecom.com)/ Mark Kromis (mark.kromis@aecom.com)					Yes or	Š				1,,,	JB	И							J DI Water K EDTA	V MCAA W pH 4-5	
Project Name.	Project #:				8	Į	1			(Ad)	1/	1		- 1			2		L EDA	Z other (spe	ecify)
CTO N6274223F0104 Sile	60697810 ssow#:				활동	7			11	~	1						- 1	8 6	Other:		
RHSF	33011#.				Sa Sa)S		K	$^{\sim}$ $^{\prime}$	1								ĕ			
				<u> </u>	2 3	<u>ਰ</u>						ll					- 1	וַּֿ			
			Sample			∏ ₹		LA						-				Number			
		Sample	Type (C=comp,	Matrix (W=water, S=solid, O=waste/oil.		اي	L	ľΙ									,	ᆲ			
Sample Identification	Sample Date	Time	(C=comp, G≡grah)	O≃waste/oil BT=Tissue, A=Air)	Fleid Filt	Įξ	1				-		_			According to		ots Eg	Special in	structions/	Note:
ouring to the financial to the first of the				ation Code.	Μ	Ā				-	1				1	7	_	X			
AF-RHMW02-WGN01LF-2306	6/9/13	1620	G	w	N	-			1	1			7		1	\top	1	3			
	1			·····	H	 				_	1	Ħ				\neg	_	┪			
		AND DESCRIPTION OF THE PERSON.		Printerpolation	4			neument .	-	-			_			Married State	-	_			
					Ш							and the same of						-1			
					H			-			T	\vdash	\dashv	\dashv	\dashv	-	-	十			
The state of the s						_		ļl			╀	ļ	110		188 B tr				!! !!!!!!!!!!		
	1 7																				
\$ (2)	111)				Ħ	1					1	t			Ш		Ш				
W A ()					Н	-	_	<u> </u>			╀	ļ	Ш								
					Ш								Ш					Ш			
a simulation					\sqcap	1					1	1	58	0-12	831	1 CI	hair	of	Custody	(BET 1181 188)	
					₩	-	-			_	┼	1									
nimen alique management										-	1_		1		\perp	\bot	\perp				
Commence of the second		and the second second second											1		-						
Possible Hazard Identification				l	' s	ample	Disi	posal	I (A fe	e mai	/ be a	sses	sed	if sar	nple	s are	ret	aine	d longer than	1 month)	
Non-Hazard Flammable Skin Irritant Poison B Un	known Rac	diological			- 1	\Box_R	etum	TOC	llent		,	ispos	al Ru	/ Lah			٦,	chiv	re For	Months	
Deliverable Requested I, II, III, IV, Other (specify)	Prelim data (Lev		ee TAT abo	ve DoD Sta						Requi	reme	nts D	OD	OSM	proi			OHIV	0,0,	Monard	
	4 report standar				٦٠																
Empty Kit Relinquished by		Date			Time)						ľ	detho	d of Si	ipme	nt:					
Relinguished by MONT Xith Math Jun	Date/Time:	132	O	Company AECOM		Rece	d bevie	y CS. YO	est a	D	>(~)	∞ v^ z	3~ I	,	ate/T	ime: /9/	12.	₹	1320	Company	000
Relinguished by Eli Marth	Date/Time: 06/12/2	3 16	30	Company AECO	A	Rece	lved b	4	1	//		.,,	<u>, , , , , , , , , , , , , , , , , , , </u>	<u> </u>		7/13		3	1612	Company	
Relinquished by:	Date/Time:	1 10,	<i></i>	Company	7	Rece	elVed.b	Ý.		f					495	// 7 Ime:		_/	IVIL	Company	
,								-	//						•		•		1] ' '	
Custody Seals Intact. Custody Seal No	-			,		Coale	er Tem	peraty	µrẽ(s) °C	and Ot	her Re	marks.				Pun	,	2	13.1		
Δ Yes Δ No																گ	_)	12.1		
																			1	Ver: 01/16/	/2019

6/20/2023

5755 8th Street East Tacoma, WA 98424

Chain of Custody Record

Client Information	Sampler Ell	Mast	t _m		ne W	/alker						Carri Fed	er Traci	king No ∧(∤ℓ((s): (16 - 0426	82	COC No: 2306AFEA02		
Client Contact	Phone: 617	579-3	612	E-Ma M.E		.Walk	er@E	urofir	nsET.	com		State Hav	of Orig	jin:				Page Page 1 of 1		
Company AECOM			PWSID [,]		T				An	alysi	s Re	aues	ted				1	Job #.		
Address	Due Date Requeste				H	Т	Т			Ť	Т	十一						Preservation Cod	ies:	_
1001 Bishop St Suite 1600	see subcontract				4 1	3									71			A - HCL B NaOH	M Hexane	
City Honolulu	IA) Reduested (da	Rush - 5	Day		П	and the second	İ							X				C Zn Acetate	N None O AsNaO2	
State Zip	Compliance Project	t A Voe	A No.		4 [ē				\mathcal{A}	1							D Nitric Acid E - NaHSO4	P Na2O4S Q Na2SO3	
Hawaii 96813 Phone	PO#:	A. 2 160	4 110		11	15	[]			^								F MeOH G Amchlor	R Na2S2O3 S H2SO4	
808-954-4512 / 770-331-0794					2	ğ	[]	Comer		5 M		1/	ſΙ			ļ		H - Ascorbic Acid	T TSP Dodecahydrate	
Email: Watson Tanji (watson.tanji@aecom.com)/ Mark Kromis (mark.kromis@aecom.com)	WO #:				S of	2 2	<u> </u>			71	L	X					2	I - Ice J Di Water	U Acetone V MCAA	
Project Name	Project #:				Sample (Yes or No)	Perform MS/MSD (Yes or No) 8015C DAI GL D5/2-42-butoxvethoxv)-ethanol				9/1/2	V				- ()		ğ	K EDTA L - EDA	W - pH 4-5 Z other (specify)	
CTO N6274223F0104 Site	60697810 ssow#:				뻍	2 3			6/	U	4				-1/		8	L - EDA Other		
RHSF					Sar					Χ					- 11		75			
			Sample	Matrix	pare				1	/					$\parallel \parallel$		Number			
			Type	(W∞water S=solid,	Ē	E C	<u> </u>										뢰			
Sample Identification	Sample Date	Sample Time	(C=comp,	8=sond, O=waste/oil, BT=Tissue, A=Air)		9015(İ	Total	Special in	structions/Note:	
Sample Identification	Sample Bate	>		ition Code.	X.	X 7				-	1				+		X			
AF-RHMW03-WGN01LF-2306	06/01/23	1205	G	w	N	N >	〈										3			
					Ш							_	h							
					П					\nearrow		17					П			
12,11				************	П							1					П			
1.14 %					TT		\Box				1,	/		1		_	П			
6/9/23					╏	\forall	1				\forall	1		7	1	1				
					11						7				7			****		
	/				П					7		7		1/	/	T	П			
	/				11					1	1			\forall		1				
	<u> </u>		/		$\dagger \dagger$	_	-			1	+	<u> </u>	H	1		+				_
Possible Hazard Identification	L				+	Samp	le Dis	posa	I (A	fee m	ay be	asse:	ssed i	f sam	ples	are re	taine	ed longer than 1	f month)	_
Non-Hazard Flammable Skin Irritant Poison E	onknown	Radi	ological		i		Retur					Dispo	sal B	/ Lab	•			ive For	Months	
Deliverable Requested I, II, III, IV, Other (specify)	Prelim data (Lev 4 report standar	vel 1or2)=se	e TAT abo	ve DoD Sta	ige S															
Empty Kit Relinquished by		Date	CONTEGUI	3 1 1 1 1 1	Tim	1e							Metho	d of Sh	ipment	:				-
Relinquished by Eli Maskin	Date/Time: 06/09/23	13	7.0	Company AECOM		Re	eceived Mi/	by.	da	D	06	~ ~ .			ate/Tim	10: 7/2:	2	1320	Company	
Relinquished by E. Mastr	Date/Time,		30 30	Company ARLOI	\sim	Re	ceived	by /	1/1		The state of the s	MY.	40		ate/Tim		2	1612	Company	
Relinquished by	Date/Time	<u> </u>	/(/	Company Company		Re	eceived	by.	//	1				Di	ate/Tim	18.	~ つ	1012	Company	_
Custody Seals Intact			·····	L		Co	ooler Te	mperat	tupe(s)	°C and	Other	Remark	s.			3	.3	13.(_
A 100 A 110																	ųr.	1	Ver. 01/16/2019	_

Client: AECOM Job Number: 580-128311-1

Login Number: 128311 List Source: Eurofins Seattle

List Number: 1

Creator: Johnson, Corey M

ordator combon, corey in		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
s the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is 66mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Eurofins Seattle